MICROSENS

# User's Manual

---

**10/100Base-TX to 100Base-FX FE Media Converter**
**Release 4.0**

# Table of Contents

## *Caution*

Circuit devices are sensitive to static electricity, which can damage their delicate electronics. Dry weather conditions or walking across a carpeted floor may cause you to acquire a static electrical charge.

To protect your device, always:

- Touch the metal chassis of your computer to ground the static electrical charge before you pick up the circuit device.
- Pick up the device by holding it on the left and right edges only.

**European Community (CE) Electromagnetic Compatibility Directive**

This equipment has been tested and found to comply with the protection requirements of European Emission Standard EN55022/EN61000-3 and the Generic European Immunity Standard EN55024.

| | |
|---|---|
| EMI | EN55022::2000, Class A |
| | EN61000-3-2:2000 |
| | EN61000-3-3:1995+A1:2001 |
| EMS | EN55024:2001 |
| | →IEC61000-4-2:1995 |
| | →IEC61000-4-3:1996 |
| | →IEC61000-4-4:1995 |
| | →IEC61000-4-5:1995 |
| | →IEC61000-4-6:1996 |
| | →IEC61000-4-8:1993 |
| | →IEC61000-4-11:1994 |

# About this user's manual

In this user's manual, it will not only tell you how to install and connect your network system but show you all the functions.

## Overview of this user's manual

# 1. Overview

IEEE802.3u 100Mbps Fast Ethernet supports two types of media, 10/100Base-TX and 100Base-FX, for network connection. The media converter has commercial and industrial different operating temperature optional specification. This media converter also supports POF (Plastic Optical Fiber) optional networking solution. It is suitable for in-door and out-door industrial Ethernet with fiber optical cable. The POF cable can use PROFINET compatible SC-RJ connector, it has special design for easy fiber cable assembling, the POF cable could be easily assembled on-site with simple tools. LFP (Link Fault Pass Through) feature enhances the TP-Fiber Link integrity and conformity.

# 2. Model Description

| Model | Power Description |
|---|---|
| TP↔ST/SC AC-DC +5V | By AC-DC Adapter |
| TP↔ST/SC USB +5V | By Self Powering Cable(USB) |

| The 100Mbps Fiber Transceiver | Wavelength |
|---|---|
| ST/SC/ multi-mode 2Km | 1310nm |

# 3. Checklist

Before you start installing the Converter, verify that the package contains the following:

— The TP-Fiber Converter
— AC-DC Power Adapter or Self Powering Cable(USB) (upon the model user purchases)
— This User's Manual

Please notify your sales representative immediately if any of the aforementioned items is missing or damaged.

# 4. Installing the Converter

⇨ Wear a grounding device for electrostatic discharge

## *4.1 TP-Fiber Converter with AC-DC Power Adapter*

**Note**: Please ensure that the power select button is on the left side of slide switch (See Fig. 6-1).

⇨ Verify that the AC-DC adapter conforms to your country AC power requirement and then insert the power plug
⇨ Install the media cable for network connection

## *4.2 TP-Fiber Converter with Self Powering Cable (USB)*

**Note**: Please ensure that the power select button is on the right side of slide switch (See Fig. 6-2).
⇨ Install USB cable. Plug type A connector in PC's USB port(jack) and type B connector in the converter's USB port (See Fig. 2)
⇨ Install the media cable for network connection

**Warning:**
Please make sure that the power of PC/USB Hub is turned on, or else the converter will not work

| | |
|---|---|
| **TP Port** | **Default:** AUTO<br>AUTO or FORCE setting, see Fig. 13 S1—Bit 1 |
| | Attach TP Cat. 5 cable to TP port, and the distance can be up to 100m.<br>Use the straight-through cable to connect the switch or workstation, the 10/100 TP port can support AUTO MDI-X sensing. |
| **Fiber Port** | **Default:** 100FDX<br>"100FDX"/"100HDX" setting, see Fig. 13 S1—Bit 5 |

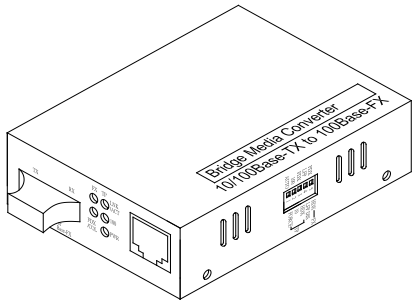



Fig. 1 Front View of LFP Bridge Media Converter

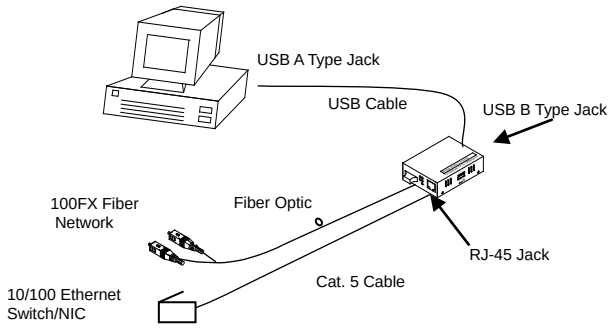



Fig. 2 Connection among USB (Type B-to-Type A Plug), Fiber and TP Cables

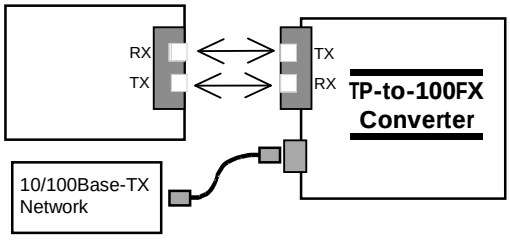



Fig. 3 Basic Network Connection

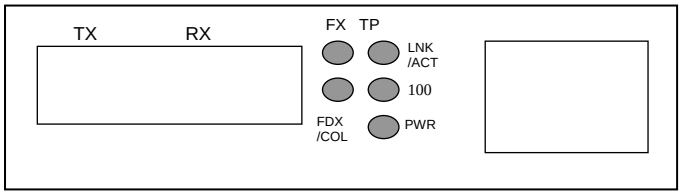



Fig. 4 Bridge Media Converter Front Panel

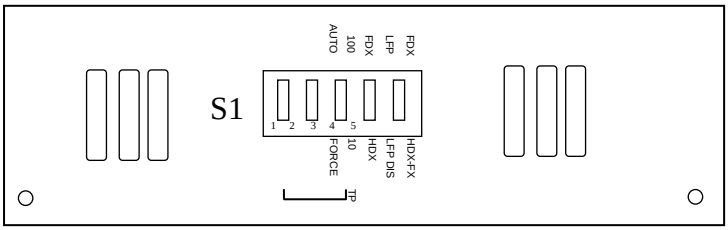



Fig. 5 Bridge Media Converter Side Panel

**Note:**
Fig. 6-1 represents that TP-Fiber Converter with AC-DC Power Adapter is enabled; Fig. 6-2 represents that TP-Fiber Converter with Self Powering Cable (USB) is enabled.

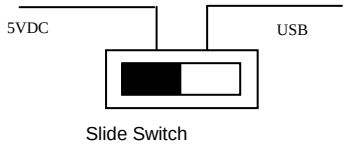



Fig. 6-1

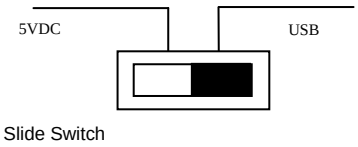



Fig. 6-2

# 5. Link Fault Pass Through

**Note:** Link fault pass through (LFP) function only takes effect as S1-Bit4 (see Fig. 13) is enabled. Disabled S1-Bit4 will turn this media converter into a general one.

This media converter supports link fault pass through (LFP) in TX/FX converter application. Link status on one port is propagated to the other port to notice the remote nodes. If TP port is unplugged, this converter stops transmission on fiber port. This causes the remote fiber node link to fail. LED shows the link failure on both TP and fiber ports. If fiber link fails, this converter restarts auto-negotiation on TP port but always stays in the link failure state. This causes the remote TP node link to fail. LED also shows the link failure on both TP and fiber ports. Refer to Fig. 9 shown below for the normal status when the link succeeds. Also refer to Fig. 10 and Fig. 11 for the erroneous status when TP Cable A, Fiber Cable B or Fiber Cable C fails to connect.

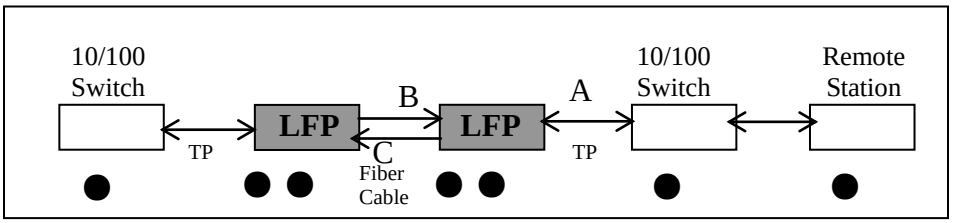



Fig. 9 Normal status via a pair of LFPs

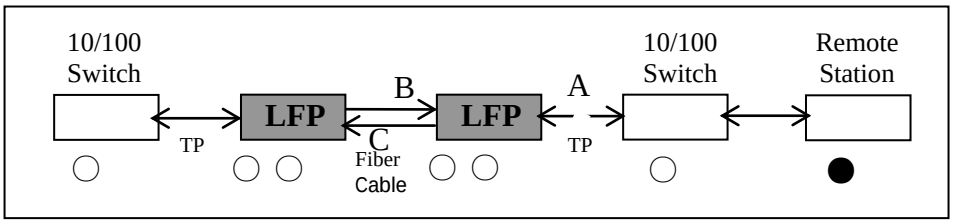



Fig. 10 The status as TP Cable A is broken

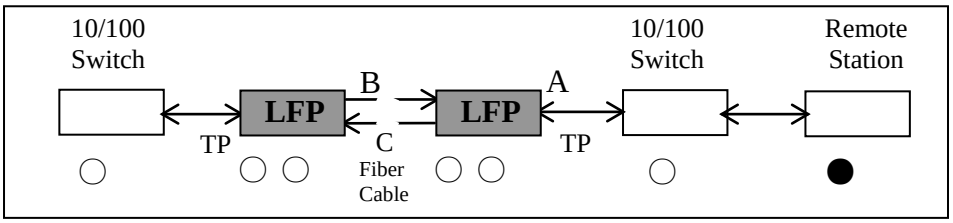



Fig. 11 The status as Fiber Cable B or C is broken

**Note** : ● indicates LNK/ACT LED Lit
○ indicates LNK/ACT LED Off

**Warning:**

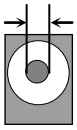
The LFP (Link Fault Pass Through) function works only when both two converters own this capability in pairs. Furthermore, both LFP converters should be supplied only by the same manufacturer/vender. The connection coming from LFP converters with odd models or non-LFP converters will cease the LFP function.

# 6. LED Description

| LED | Color | Function |
|---|---|---|
| FX LNK/ACT | Green | Lit when fiber connection is good<br>Blinks when fiber data is present |
| FX<br>FDX/COL | Amber | Lit when full-duplex mode is active<br>Off when half-duplex is active<br>Blinks when collision is present |
| TP LNK/ACT | Green | Lit when TP connection is good<br>Blinks when TP data is present |
| TP 100 | Green | Lit when TP speed is 100Mbps<br>Off when TP speed is 10Mbps |
| PWR | Green | Lit when +5V power is coming up |

# 7. DC Jack and AC-DC Power Adapter

The DC jack's central post is 2.5mm wide and conforms to the DC receptacle (2.5mm) on the 19-inch Converter Rack slot.



DC Jack : 2.5mm
DC Input : +5V

Fig. 12 DC+5V Input Jack and Dimension

# 8. Connecting to TP, Fiber Device

| | |
|---|---|
| Converter<br>TP Port<br>10/100TP | AUTO, FORCE selectable: Bit 1, 2, 3 of S1<br>a. AUTO: 10/100 NWay Auto-negotiation<br>b. FORCE: 100 or 10, FDX or HDX |
| Converter<br>Fiber Port<br>100FX | 100Mbps duplex selectable: Bit 5 of S1<br>a. FDX for 100FDX fiber link partner, default<br>b. HDX for 100HDX fiber link partner |

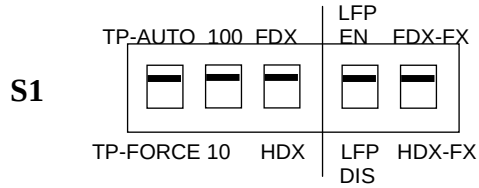



Fig. 13 S1—Bit 1, 2, 3, 4, 5 Configuration and Setting

S1-1 TP port mode : AUTO (default) or FORCE
S1-2 TP port speed : 100 or 10 when TP at Force
S1-3 TP port duplex : FDX or HDX when TP at Force
S1-4 LFP : LFP enabled (default) or disabled
S1-5 Fiber port duplex : 100FDX (default) or 100HDX

**Note:**
1. S1-2 and S1-3 will take effect only when S1-1 is set at TP-FORCE.

**Warning:**
— When TP NWay port is connected to TP 100FDX(force mode) instead of NWay partner, it will result in 100HDX mode with invalid collision signal
— Ensure that all network nodes are configured at an identical operation mode. Improper operation and flow control mode between TP and Fiber port connections will render the LAN to work poorly

# 9. Cable Connection Parameter

100Base-X network allows 512-bit time delay between any two node-stations in a collision domain. Switch-based Media Converter breaks up TP and Fiber segments' collision domain to extend the cabling distance.

- **TP Cable Limitations:** Cat. 5 and up to 100m
- **Converter Fiber Cable Limitations:**

| SC/ST Converter Models | |
|---|---|
| Multi-mode Half-duplex | 412m |
| Multi-mode Full-duplex | 2Km |
| Single-mode Half-duplex | 412m |
| Single-mode Full-duplex | 15Km |

# 10. TP-Fiber Technical Specifications

- **Standards** :IEEE802.3u 10/100Base-TX, 100Base-FX
- **UTP Cable** :Cat. 5 cable and up to100m
  **Fiber Cable** :
  50/125, 62.5/125 or 100/140μm multi-mode
  8.3/125, 8.7/125, 9/125 or 10/125μm single-mode
- **LED Indicators** :
  POWER, TP LNK/ACT, 100, FX LNK/ACT, FDX/COL
- **Data Transfer Rate :**

| Speed | Forwarding Rate |
|---|---|
| 100Mbps | 148,800 PPS |
| 10Mbps | 14,880 PPS |

- **Flow Control:** IEEE802.3x compliant for full-duplex
  Backpressure flow control for half-duplex
- **Power Requirement** : 1A@+5VDC above AC-DC Adapter
  0° to 50°C (Commercial)
  : 1A@+5VDC above AC-DC Adapter
  0° to 60°C (Industrial)
- **Ambient Temperature** : 0° to 50°C (Commercial)
  : 0° to 60°C (Industrial)
- **Humidity** : 5% to 90%
- **Dimensions** : 26.2(H) × 70.3(W) × 94(D) mm
- **CE Mark**

**Note:** For connecting this device to Router, Bridge or Switch, please refer to the corresponding device's Technical Manual.